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Chow

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(54) **BALLOON POWERED BUBBLE BLOWING DEVICE**

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(58) **Field of Search** 446/15, 16, 18, 446/20, 21; 40/408

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,560,582	*	6/1946	Limber	446/18
3,246,419		4/1966	Pawelka .	
3,736,694	*	6/1973	Lebensfeld	446/16
3,834,066	*	9/1974	Vargas	446/21
4,299,049	*	11/1981	Pimentel et al.	446/15
4,775,348	*	10/1988	Collins	446/16
5,360,362	*	11/1994	Cernansky et al.	446/16

FOREIGN PATENT DOCUMENTS

5285278	*	11/1993	(JP)	446/15
6182060	*	7/1994	(JP)	446/15

* cited by examiner

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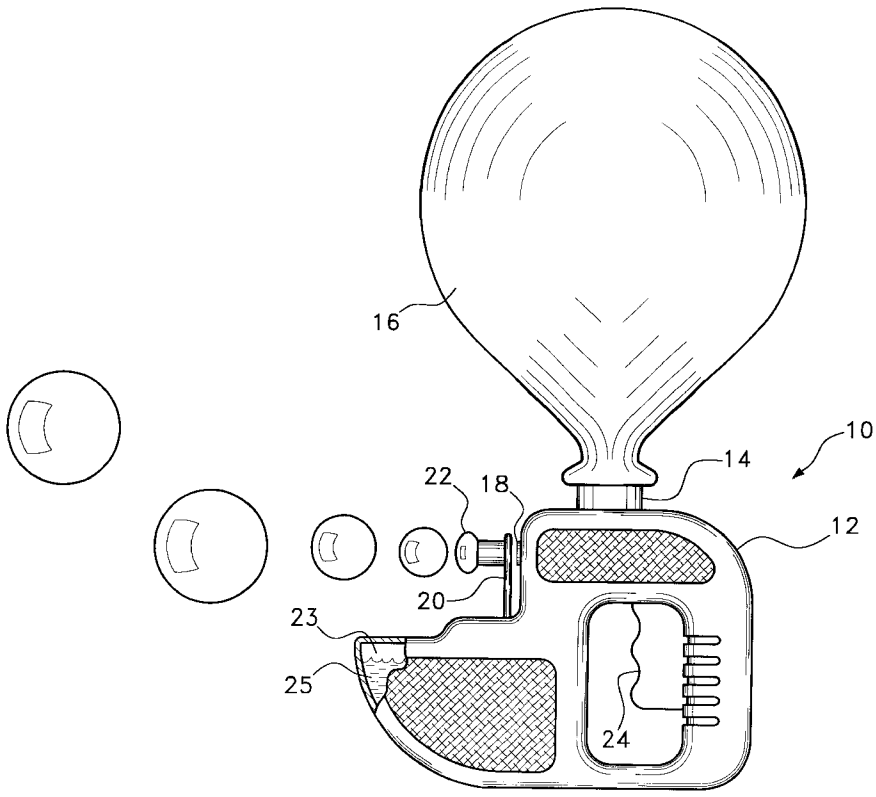
(57) **ABSTRACT**

A bubble blowing assembly used to blow bubbles made of soap film. The bubble blowing assembly includes a housing. In the housing is formed an air flow chamber having a first end and a second end. A one-way valve is disposed at the first end of the air flow chamber. The one-way valve connects to a balloon or another inflatable air vessel. An arm is pivotally connected to the housing and is selectively positionable between a first position and a second position. The arm defines an aperture. When the arm is in the first position, the aperture on the arm is positioned in said reservoir. When the arm is positioned in the second position, the aperture on the arm is positioned next to the second end of the air flow chamber. An activation mechanism is provided within the housing. The activation mechanism engages both the one-way valve and the arm. When the activation mechanism is in an operating position, the activation mechanism moves both the one-way valve to its open condition and the arm to its second position. When the activation mechanism is in a non-operating position, the activation mechanism moves both the one-way valve to its closed condition and the arm to its first position.

14 Claims, 2 Drawing Sheets



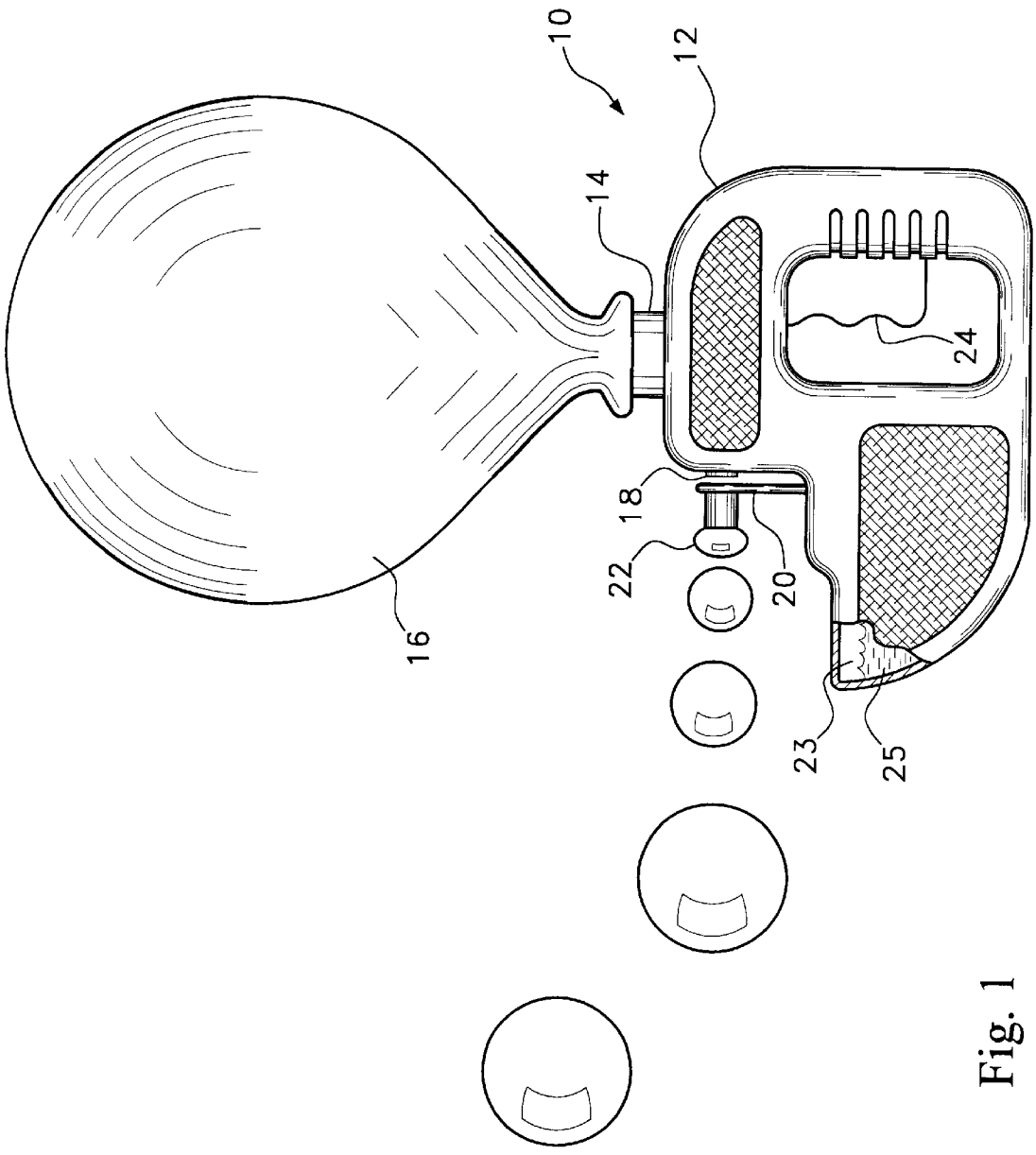


Fig. 1

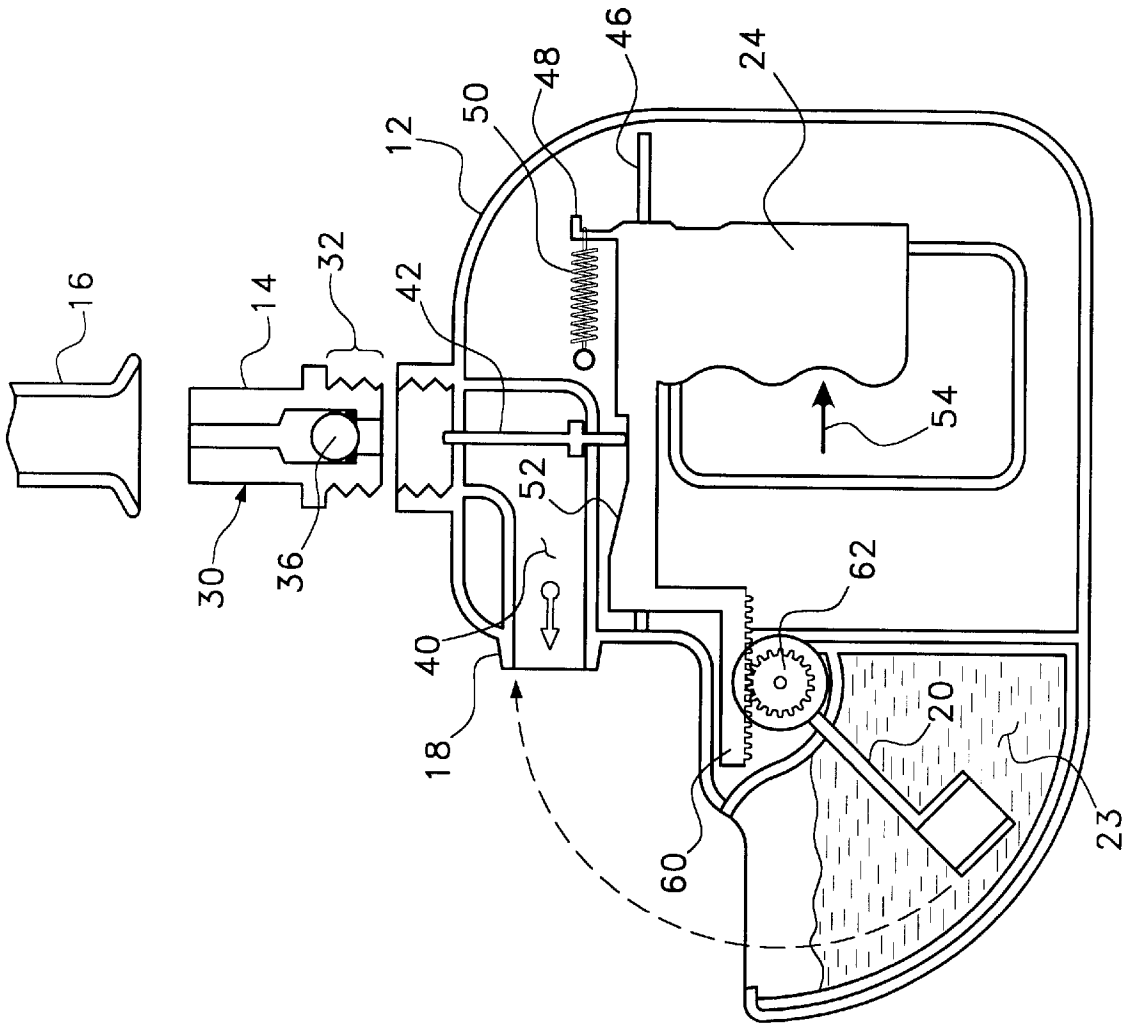


Fig. 2

BALLOON POWERED BUBBLE BLOWING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

In general, the present invention relates to amusement devices that are used to blow bubbles. More particularly, the present invention relates to bubble blowing devices that contain internal sources of air so that bubbles can be created without manual blowing.

2. Description of the Prior Art

Bubble blowing devices have been popular with children for many generations. In that time, bubble blowing devices have been created in countless designs and styles. As such, the prior art is replete with many different types of bubble blowing devices.

Bubble blowing devices typically have the same functioning elements. A reservoir is provided for holding soapy water. An annular structure is provided to dip into the soapy water. Once dipped in the soapy water, a soap film extends across the annular structure. A stream of air is then blown through the annual structure, thereby creating bubbles from the soap film.

Typically, a child provides a stream of air by physically blowing air through the annular structure. Such a technique is simple. However, young children often have difficulty directing a stream of air with their mouths. As such, manual bubble blowing becomes difficult, if not impossible for certain children. Furthermore, manually blowing bubbles causes children to bring the annular structure close to their faces. As the bubbles are manually blown, many of the bubbles prematurely pop. This often causes the soap film to splash into the eyes of the child. With some children, the soapy film irritates the eye and causes discomfort.

To eliminate the above mentioned problems, bubble blowing devices have been invented that have the ability to generate their own stream of air. Some of these prior art devices use battery operated fans to create the stream of air. Other prior art devices use a hand pump to generate the needed stream of air. Such devices, however, are expensive because of the numerous parts needed in the manufacture of such devices.

A need therefore exists for a bubble blowing device that provides its own stream of air, yet is very low in cost and simple to manufacture. This need is met by the present invention as described and claimed below.

SUMMARY OF THE INVENTION

The present invention is a bubble blowing assembly used to blow bubbles made of soap film. The bubble blowing assembly includes a housing. In the housing is formed an air flow chamber having a first end and a second end. A one-way valve is disposed at the first end of the air flow chamber. The one-way valve connects to a balloon or another inflatable air vessel. An arm is pivotally connected to the housing and is selectively positionable between a first position and a second position. The arm defines an aperture. When the arm is in the first position, the aperture on the arm is positioned in a soap film reservoir. When the arm is positioned in the second position, the aperture on the arm is positioned next to the second end of the air flow chamber.

An activation mechanism is provided within the housing. The activation mechanism engages both the one-way valve and the arm. When the activation mechanism is in an operating position, the activation mechanism moves both the one-way valve to its open condition and the arm to its second position. When the activation mechanism is in a non-operating position, the activation mechanism moves both the one-way valve to its closed condition and the arm to its first position. The result is a simple hand held device that uses the air stream from a balloon to selectively blow bubbles.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, reference is made to the following description of an exemplary embodiment thereof, considered in conjunction with the accompanying drawings, in which:

FIG. **1** is a side view of an exemplary embodiment of a bubble blowing device in accordance with the present invention; and

FIG. **2** is a cross-sectional view of the embodiment of the present invention shown in FIG. **1**.

DETAILED DESCRIPTION OF THE INVENTION

The present invention device uses air from a balloon to blow bubbles. The shape of the present invention device is not of importance and it should be understood that the housing of the device can be shaped in any manner, provided the housing supports the functioning elements that are described below in the exemplary embodiment.

Referring to FIG. **1**, an exemplary embodiment of a bubble blowing device **10** is shown in accordance with the present invention. The bubble blowing device **10** contains a housing **12**. At the top of the housing **12** is positioned a cylindrical supply stem **14**. A latex balloon **16** is attached to the cylindrical supply stem **14** in a manner that will be explained later. The balloon **16** supplies the bubble blowing device **10** with a source of pressurized air. Within the housing **12**, the pressurized air is selectively directed to an output air port **18** that projects forward from the housing **12**.

Within the housing **12** of the bubble blowing device **10** is a reservoir **23** that is filled with soapy water **25**. A dipping arm **20** is pivotably connected to the housing **12** adjacent to the reservoir **23**. The dipping arm **20** defines a bubble aperture through which bubbles **22** are formed. The dipping arm **20** pivotably rotates between two positions. In a first position, the bubble aperture is immersed in the reservoir **23**. In the second position, the aperture of the dipping arm **20** is rotated in front of the output air port **18**.

A trigger handle **24** extends from the housing **12**. The trigger handle **24** serves two functions when squeezed. First, when the trigger handle **24** is squeezed, the trigger handle **24** enables air from the latex balloon **16** to flow through the housing **12** to the output air port **18**. This causes a stream of air to project from the output air port **18**. Second, when the trigger handle **24** is squeezed, the trigger handle **24** moves the dipping arm **20** from the first position in the reservoir **23** to the second position in front of the output air port **18**. Since a stream of air is projected out of the output air port **18**, bubbles **22** are formed through the aperture in the dipping arm **20**.

Referring to FIG. **2**, it can be seen that the cylindrical supply stem **14** is part of a one-way valve assembly **30**. The one-way valve assembly **30** has a threaded neck **32** that threads into the housing **12**. Within the one-way valve **30** is a valve ball **36**. The air pressure within the balloon **16** biases the valve ball **36** into a closed position that prevents air from entering or exiting the bottom of the one-way valve **30**.

The latex balloon **16** attaches to the cylindrical supply stem **14** of the one-way valve **30**. The balloon **16** is attached

to the one-way valve **30** in a deflated condition. To inflate the balloon **16**, the one-way valve **30** is detached from the housing **12** of the bubble blowing device **10**. A person then blows air through the bottom of the one-way valve **30**. The blowing of the air into the bottom of the one-way valve **30** displaces the valve ball **36** against the bias of the air pressure of the balloon **16** and enables air to flow through the one-way valve **30** and into the balloon **16**. When a person stops blowing air into the one-way valve **30**, the air pressure in the balloon **16** again advances the valve ball **36** and prevents air from flowing back out the bottom of the one-way valve **30**. As such, the one-way valve **30** enables air to be blown into the balloon **16** but prevents air from escaping from the inflated balloon **16**.

Once the balloon **16** is inflated, the one-way valve **30** is again attached to the housing **12**. Once attached to the housing **12**, the one-way valve **30** communicates with an air flow chamber **40**. The air flow chamber **40** leads to the output air port **18**. Consequently, when the one-way valve **30** is opened, air from the balloon **16** is directed to the output air port **18**.

An activation rod **42** extends through the air flow chamber **40**. The activation rod **42** is concentrically aligned with the one-way valve **30** and is positioned directly below the one-way valve **30**. When the activation rod **42** is biased upwardly, the top of the one-way valve **30** presses against the valve ball **36** within the one-way valve **30**. When the upward force from the activation rod **42** surpasses the downward force from the pressure differential in the balloon **16**, the valve ball **36** is displaced and air flows from the balloon **16** into the air flow chamber **40**.

The activation rod **42** is moved upwardly by the trigger handle **24**. The trigger handle **24** is slotted and engages a support rib **46** within the housing **12**. The trigger handle **24** is free to move reciprocally along the length of the support rib **46**. However, the support rib **46** prevents the trigger handle **24** from moving out of the horizontal plane of the support rib **46**.

A pawl **48** extends upward from the rear of the trigger handle **24**. The pawl **48** is engaged by a spring **50** that is anchored at one side to the housing **12**. The spring **50** provides a bias to the trigger handle **24** that biases the trigger handle **24** into one set position along the support rib **46**.

A ramped structure **52** is formed on a segment of the trigger handle **24**. When the trigger handle **24** is squeezed in the direction of arrow **54**, the trigger handle **24** is moved against the bias of the spring **50** and the ramped structure **52** moves under the bottom of the activation rod **42**. The ramped structure **52** acts as a cam and pushes the activation rod **42** upward. As the activation rod **42** moves upward, the activation rod **42** opens the one-way valve **30**, in the manner previously described. Accordingly, when the trigger handle **24** is squeezed, the one-way valve **30** is opened and a stream of air passes from the balloon **16** out through the output air port **18**.

A gear rack **60** also extends from the trigger handle **24**. The gear rack **60** engages a pinion gear **62** that is part of the dipping arm **20**. As the trigger handle **24** is squeezed, the gear rack **60** moves horizontally. This causes the pinion gear **62** to turn. As the pinion gear **62** turns, the dipping arm **20** rotates from the first position in the reservoir **23** to the second position in front of the output air port **18**. When in the first position, the aperture on the dipping arm **20** is immersed in the reservoir **23**. As the dipping arm **20** rotates to the second position, the aperture is lifted out of the reservoir **23** and held in front of the output air port **18**. If the aperture supports a soap film, the flow of air out of the output air port **18** creates bubbles.

The amount of bubbles created is dependent upon the volume of soapy water present around the aperture on the dipping arm **20**. When there is no more soap film available at the aperture, the trigger handle **24** is released and again squeezed. This action causes the dipping arm **20** to again dip into the reservoir **23** and lift a new volume of soapy water to the output air port **18**. The cycle can be repeated as many times as is desired until either the soapy water within the reservoir **23** fall below an effective level or the air from the balloon **16** is exhausted.

It will be understood that the embodiment of the present invention bubble blowing device that is described and illustrated herein is merely exemplary and a person skilled in the art can make many variations to the embodiment shown without departing from the scope of the present invention. For example, the shape, size and appearance of the bubble blowing device can be altered as desired. Furthermore, the position of the balloon and the position of the output port can be repositioned on the bubble blowing device, as desired. All such variations, modifications and alternate embodiments are intended to be included within the scope of the present invention as defined by the appended claims.

What is claimed is:

1. A bubble blowing assembly, comprising:

an air flow chamber having a first end and a second end;

a reservoir for retaining a volume of bubble material;

a one-way valve disposed at said first end of said air flow chamber, wherein said one-way valve is capable of being in an open condition and a closed condition;

an arm that defines an aperture, wherein said arm is selectively positionable between a first position, where said aperture is positioned in said reservoir, and a second position, where said aperture is positioned next to said second end of said air flow chamber;

an activation mechanism that engages both said one-way valve and said arm, wherein said activation mechanism is selectively positionable between an operating position, where said activation mechanism moves both said one-way valve to said open condition and said arm to said second position, and a non-operating position, where said activation mechanism moves both said one-way valve to said closed condition and said arm to said first position.

2. The assembly according to claim **1**, further including a source of pressurized air coupled to said first end of said air flow chamber.

3. The assembly according to claim **2**, wherein said source of pressurized air is a balloon.

4. The assembly according to claim **1**, wherein said one-way valve includes a cylindrical stem around which a balloon can be coupled.

5. The assembly according to claim **1**, wherein said air flow chamber and said reservoir are disposed in a common housing and said one-way valve is selectively detachable from said common housing.

6. The assembly according to claim **1**, wherein said arm contains a pinion gear thereon and said activation mechanism includes a gear rack that engages said pinion gear and turns said pinion gear as said activation mechanism is moved between said operating position and said non-operating position.

7. The assembly according to claim **1**, further including an activation rod that opens said one-way valve when said activation rod is biased against said one-way valve.

8. The assembly according to claim 7, wherein said activation device includes a cam surface that biases said activation rod against said one-way valve when said activation mechanism is moved from said non-operating position to said operating position.

9. The assembly according to claim 1, further including a spring coupled to said activation mechanism for biasing said activation mechanism into said non-operating position.

10. A device for blowing bubbles, comprising:

an inflatable air reservoir having an exit port;

a valve coupled to said exit port for selectively controlling the ability of a stream of air to flow from said inflatable air reservoir through said exit port;

a liquid reservoir;

an arm that defines an aperture, wherein said arm is selectively positionable between a first position, where said aperture is positioned in said liquid reservoir, and a second position, where said aperture is positioned in front of said stream of air; and

an activation mechanism for selectively moving said arm into said second position and opening said valve when said arm is in said second position.

11. The device according to claim 10, wherein said inflatable air reservoir is a balloon.

12. The device according to claim 10, wherein said liquid reservoir, said arm and said activation mechanism are contained within a common housing.

13. The device according to claim 12, wherein said valve is selectively attachable and detachable from said common housing.

14. The device according to claim 10, wherein said arm is coupled to said activation mechanism by at least one gear.

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